Women, Gender, and Utopia: The Death of Nature and the Historiography of Early Modern Science

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ABSTRACT

This essay reflects on the ambivalent reception of *The Death of Nature* among English-speaking historians of early modern science. It argues that, despite its importance, the book was mostly ignored or marginalized by these historians (as opposed to historians interested in feminist or environmental studies) for a variety of reasons. These included the special role played by the "Scientific Revolution" in the grand narrative that increasingly shaped the historiography of science beginning in the 1940s and the subsequent "hyperprofessionalism" of the discipline as a whole. The essay concludes by placing Carolyn Merchant's work in the context of feminist utopian writing of the late 1970s and calls for renewed attention to the history of the utopian genre as a resource for teachers and feminist scholars of the history of science.

IN 1977, three years before the appearance of *The Death of Nature*, Renate Bridenthal and Claudia Koonz published *Becoming Visible: Women in European History*. The most famous essay in that now-famous anthology was probably Joan Kelly's "Did Women Have a Renaissance?" Kelly answered her own question with a resounding "no." "One of the tasks of women's history," she wrote, "is to call into question accepted schemes of periodization. To take the emancipation of women as a vantage point is to discover that events that further the historical development of men, liberating them from natural, social, or ideological constraints, have quite different, even opposite, effects upon women." According to Kelly, the dramatic economic and political changes that "reorganized Italian society along modern lines and opened the possibilities for the social and cultural expression for which the age is known . . . affected women adversely, so much so that there was no renaissance for women—at least not during the Renaissance."[1]

There are many parallels between the argument in Kelly's essay and that in Carolyn

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[1] Joan Kelly-Gadol, "Did Women Have a Renaissance?" in *Becoming Visible: Women in European History*, ed. Renate Bridenthal and Claudia Koonz (Boston: Houghton Mifflin, 1977), pp. 137–164, on p. 139.

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Merchant's book, for which the subtitle "Did Women Have a Scientific Revolution?" would have been quite appropriate. Both historians accepted the grand narrative that identified the birth of modernity out of a supposedly less dynamic medieval order. While Kelly focused on the arena of political and psychic self-determination and cultural achievement (the Renaissance as described by Jacob Burckhardt), Merchant explored the arena of natural knowledge and material progress (the Scientific Revolution as described by historians of science such as Alexandre Koyré and Herbert Butterfield, themselves notably influenced by Burckhardt's account of the Renaissance "discovery of the world and of man").[2] But both Kelly and Merchant offered strongly revisionist readings of these two transformations, redescribing the early modern period as one in which women, far from participating in a general movement of liberation and progress, found themselves increasingly subordinated and excluded from economic and political power. Merchant further correlated this change with new scientific and commercial values that sanctioned the domination and exploitation of nature, long personified in female terms. For women, she argued, referring to sixteenth- and seventeenth-century views concerning women's reproductive functions, "the Scientific Revolution did not bring about the presumed intellectual enlightenment, objectivity, and liberation from ancient assumptions traditionally accorded it."[3]

Yet despite the obvious parallels between them, these two works of revisionist feminist historiography had strikingly different fates among early modern historians in their respective fields. Although outdated, Kelly's essay is still cited frequently and reverently by historians of women and gender in medieval and Renaissance Europe as a pathbreaking achievement, while Merchant's book, despite its status as a classic of both environmental history and ecofeminism—and despite the enthusiasm it continues to generate among students and its influence on historians of early modern art and literature—is rarely cited by historians and philosophers of early modern science. The few who continue to invoke it do so mostly to criticize it for its pointed—and in my view generally accurate—analysis of Francis Bacon's description of the search for natural knowledge in terms of a physically coercive relationship between male inquirer and female nature, expressed in metaphors of marital discipline, inquisition, and rape.[4] For the most part, however, it is simply ignored.

The contrast between the reverence for Kelly's essay among early modern historians and the ambivalence toward Merchant's book among historians of early modern science is striking, given how much stronger—as a piece of historiography—the latter is than the former, even in the context of the late 1970s: Merchant's arguments are better developed and more nuanced than Kelly's, the range of evidence she cites is far more extensive and

[2] Alexandre Koyré, *Etudes galiléennes* (Paris: Hermann, 1940); Koyré, *From the Closed World to the Infinite Universe* (Baltimore: Johns Hopkins Press, 1957); and Herbert Butterfield, *The Origins of Modern Science* (London: Bell, 1950). Cf. Jacob Burckhardt, *The Civilization of the Renaissance in Italy*, Pt. 4, trans. S. G. C. Middlemore, 2 vols. (New York: Harper & Row, 1959), Vol. 2, pp. 279–352.

[3] Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (1980; San Francisco: Harper & Row, 1989), p. 163 (all quotations are from the 1989 edition, which will hereafter be cited as **Merchant, *Death of Nature***). Merchant generalized a number of her central claims in "*Isis*' Consciousness Raised," *Isis*, 1982, *73*:398–409.

[4] The literature in this vein is voluminous. From Merchant's most strident critic, Alan Soble, see "In Defense of Bacon," *Philosophy of the Social Sciences*, 1995, *25*:192–215; for a more moderate critique see Peter Pesic, "Wrestling with Proteus: Francis Bacon and the 'Torture' of Nature," *Isis*, 1999, *90*:81–94. Iddo Landau summarizes some of the issues in "Feminist Criticisms of Metaphors in Bacon's Philosophy of Science," *Philosophy*, 1998, *73*:47–61. Much of this work, which argues that Bacon envisaged the relationship between natural philosopher and nature in terms of marriage, not rape or physical coercion, tends to discount the ways in which the contemporary ideology of marriage associated this with rape, defined in classical terms as the forcible capture or kidnapping of a women for purposes of marriage or procreation.

original, and her methodological statements concerning historical change in the realm of ideas are infinitely more sophisticated. This is not to detract from Kelly's considerable achievement, but to stress the peculiarity of the reaction to Merchant's work within the discipline of the history of science, especially given the early presence of strong feminist voices within the subfield devoted to the study of medieval and early modern Europe.[5] I propose here to try to explain the reception of *The Death of Nature* among English-speaking historians of early modern science in two main contexts, neither of which might appear on the surface to have much to do with feminism *per se*: the decline of what the Focus section in the June 2005 issue of *Isis* terms "the generalist vision in the history of science," on the one hand, and the internalism/externalism debates of the 1960s and 1970s, on the other. I will argue that these two related developments created a chilly climate for Merchant's erudite and provocative book. I will then reflect briefly on what we have lost by turning our backs not just on "generalist visions" and grand narratives in general, but on the particular type of grand narrative of which Merchant's book is a wonderful example and which I believe still has an important role to play in a feminist historiography of science.

The four essays in the June 2005 Focus section eloquently describe the retreat of Anglophone historians of science, beginning in the late 1970s and early 1980s, from what had been our discipline's originary narrative and founding narrative conventions.[6] The field was at that point a scant thirty or forty years old and rapidly outgrowing what Robert Kohler and Paula Findlen call the mid-twentieth-century "consensus" regarding science and its history inherited from Burckhardtian historiography and nineteenth-century philosophical positivism. This consensual view identified science as one of the principal hallmarks of modernity, informed by values of freedom of inquiry and rationality, as opposed to superstition and reverence for tradition and authority, which were often described in religious terms; it also assumed science to be one of the primary motors of social and material progress in human history. The "Scientific Revolution" was central to this vision. It was during this period that "modern science" was supposedly born through the work of a series of heroic individuals, beginning (usually) with Nicholas Copernicus and ending (usually) with Isaac Newton, who collectively took the closed, geo- and anthropocentric cosmos of medieval learned writers, organized around forms and qualities, and transformed it, by judicious application of the "scientific method," into an open, infinite universe governed by mathematical laws.

This protean and powerful story, the shortcomings of which I need not belabor, was enormously attractive, seducing several generations of undergraduates, including mine, and acquiring broad purchase in other fields through, for example, the writings of Thomas S. Kuhn.[7] As the history of science developed into an autonomous discipline with its own degrees and departments, however, it increasingly adopted both a more critical and less blinkered attitude toward its object and more sophisticated research methodologies, borrowed in large part from general history. Historians of science immersed themselves in

[5] For Merchant's own description of the otherwise generally positive reception of *The Death of Nature*, together with a list of reviews, see Carolyn Merchant, "*The Death of Nature*: A Retrospective," *Organization and Environment*, 1998, *11*:198–206.

[6] Robert Kohler, "A Generalist's Vision," *Isis*, 2005, *96*:224–229; Paula Findlen, "The Two Cultures of Scholarship?" *ibid.*, pp. 230–237; Steven Shapin, "Hyperprofessionalism and the Crisis of Readership in the History of Science," *ibid.*, pp. 238–243; and David Kaiser, "Training and the Generalist's Vision in the History of Science," *ibid.*, pp. 244–251. Also useful is Mario Biagioli, "The Scientific Revolution Is Undead," *Configurations*, 1998, *6*:141–148.

[7] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: Univ. Chicago Press, 1962).

archives and in the publications of obscure writers on natural topics, whose ideas were sometimes even patently misguided, as well as in the great works of great men. They studied spaces, practices, apparatuses, and patronage relations as well as theories and ideas. They looked beyond astronomy, cosmology, and physics to the life sciences—and even as far afield as alchemy and natural history—and they focused on case studies and local developments. In the face of this dramatic expansion of material, the old narrative of the Scientific Revolution, while still highly teachable and highly appealing outside the field, rapidly lost credibility among specialists.

Appearing just as this process was moving into full gear, *The Death of Nature* fell afoul of practitioners of both the old- and the new-style history of early modern science. It posed an obvious and direct challenge to the consensus narrative of the Scientific Revolution. Merchant did not contest the idea that there had been a Scientific Revolution in the sixteenth and seventeenth centuries. Rather, she argued that the complicated bundle of jostling ideas that came to constitute "modern science," in the sense that had become traditional, in fact had a sinister cast. Instead of liberating the human mind and laying the foundations for general human happiness, it both reflected and encouraged the continued and increasing subjection of women and the exploitation of the natural world. Rejecting the respectful metaphor of nature as a benevolent and nurturing mother, it replaced this personification with a new one, of nature as an indifferent, destructive, and uncontrollable woman; this idea drew on and magnified deep currents of misogyny that underpinned the European witch trials, which reached their height in the century following the publication of Copernicus's *De revolutionibus orbium celestium* in 1543. According to Merchant, the latter personification of nature as threatening and disorderly legitimated attempts to dominate the natural world and deny its vitality and agency; this ultimately produced the view of nature associated with the mechanical philosophy of Descartes, Hobbes, and others, who described it as a machine composed of lifeless, passive matter: the "death of nature" of her book's title.[8]

This rich, energetic, and provocative argument had relatively little purchase among believers in the traditional narrative of the Scientific Revolution, who mostly rejected or ignored it. (The main exceptions were those I think of as the Friends of Bacon [FOBs]—mostly philosophers rather than historians—who have devoted many articles to defending the Lord Chancellor from Merchant's charges that he couched his method of natural inquiry in sexist terms.[9]) At the same time, Merchant's embrace not only of the idea of the Scientific Revolution, as appears in her subtitle, but also of the genre of grand narrative—however different the political values that inspired it and however different its conclusions from those of Butterfield and Koyré—had little credibility in the eyes of those who believed that the discipline would mature only through precise and detailed case and local studies based on the exhaustive and meticulous reading of primary sources in critical editions and original languages. To professional historians of science working in this vein, Merchant's book seemed to have a number of the faults of the older historiography: not only did it deal with the epochal story of the "origins of modern science," but it appeared equally partisan and equally shot through with anachronism and contemporary values, albeit of a very different sort.

[8] Merchant, *Death of Nature*, p. 193: "The removal of animistic, organic assumptions about the cosmos constituted the death of nature—the most far-reaching effect of the Scientific Revolution." See also *ibid.*, Chs. 1, 3–5, 8.

[9] See note 4, above.

In addition to this broad transformation in professional ideas about appropriate approaches to the history of early modern science, *The Death of Nature* fell afoul of—more accurately, jumped feet first into—a more specific set of debates, now late and universally unlamented, between proponents of the "internalist" and of the "externalist" history of science. For historians of science in general, these debates had to do with the degree to which the evolution of scientific theories was guided by its own internal logic and rationality, rather than by ideas from outside science (e.g., from politics and religion) and by the social and material interests of its practitioners and their patrons.[10] For historians of early modern science in the 1970s and early 1980s, however, the internalism/externalism debates reduced in practice to a single topic: the claim by the British historian Frances Yates, first sketched in *Giordano Bruno and the Hermetic Tradition* (1964) and developed in "The Hermetic Tradition in Renaissance Science" (1967) and *The Rosicrucian Enlightenment* (1972), that the Scientific Revolution—which she, too, conceived as the origin of modern science—occurred as the direct result of the recovery and dissemination of a particular set of ideas located in a particular body of late antique texts attributed to the mythical sage Hermes Trismegistus. These ideas centered on manipulating the self and the world using what were understood to be powerful techniques rooted in astrological magic, alchemy, and what Yates called "cosmic mysticism." Because they harnessed the awesome forces of the stars and planets, as opposed to lowly elemental principles, such techniques seemed to offer almost unimaginable power to transform the self and the material world. Thus, Yates argued, "it is the Renaissance magus . . . who exemplifies that changed attitude of man to the cosmos which was the necessary preliminary to the rise of science."[11]

Yates's work unleashed a set of defensive reactions that lasted well into the 1980s.[12] Her claim that the history of magic, astrology, alchemy, and related approaches to nature was necessary and integral to the history of science struck at the heart of the midcentury view that "modern science"—the science of the Scientific Revolution—was in its essence "rational," which was everything that magic, astrology, and alchemy supposedly were not. The specifics of these debates are less relevant to my argument than their intensity, although it is worth noting that now, more than forty years later, most historians of early modern science, while rejecting many of Yates's specific conclusions, would nonetheless accept her general point: it is impossible coherently to define early modern natural inquiry so as

[10] See Steven Shapin, "Discipline and Bounding: The History and Sociology of Science as Seen through the Externalism-Internalism Debate," *History of Science*, 1992, *30*:333–369.

[11] Frances Yates, *Giordano Bruno and the Hermetic Tradition* (London: Routledge & Kegan Paul, 1964); Yates, "The Hermetic Tradition in Renaissance Science," in *Art, Science, and History in the Renaissance*, ed. Charles S. Singleton (Baltimore: Johns Hopkins Press, 1967), pp. 255–274, on p. 255; and Yates, *The Rosicrucian Enlightenment* (London: Routledge & Kegan Paul, 1972). On Yates's work and its reception see Brian Copenhaver, "Natural Magic, Hermetism, and Occultism in Early Modern Science," in *Reappraisals of the Scientific Revolution*, ed. David Lindberg and Robert S. Westman (Cambridge: Cambridge Univ. Press, 1990), pp. 261–301. Yates was building on the work of well-established Continental historians such as Eugenio Garin, Paolo Rossi, Paola Zambelli, and Walter Pagel, as well as that of her colleague at the Warburg Institute, D. P. Walker.

[12] See, e.g., Mary Hesse, "Hermeticism and Historiography: An Apology for the Internal History of Science," in *Historical and Philosophical Perspectives of Science*, ed. Roger H. Stuewer (Minnesota Studies in the Philosophy of Science, 5) (Minneapolis: Univ. Minnesota Press, 1970), pp. 134–160; Edward Rosen, "Was Copernicus a Hermetist?" *ibid.*, pp. 163–171; Brian Vickers, ed., *Occult and Scientific Mentalities in the Renaissance* (Cambridge: Cambridge Univ. Press, 1984), esp. Vickers's introduction (pp. 1–55); and the essays in Ingrid Merkel and Allen G. Debus, eds., *Hermeticism and the Renaissance: Intellectual History and the Occult in Early Modern Europe* (Washington, D.C.: Folger Books, 1988). For an informed and reflective critical assessment of Yates's work see Robert S. Westman, "Magical Reform and Astronomical Reform: The Yates Thesis Reconsidered," in Westman and J. E. McGuire, *Hermeticism and the Scientific Revolution* (Los Angeles: William Andrews Clark Memorial Library, 1977), pp. 1–91.

to include disciplines and approaches recognized as "scientific" in the second half of the twentieth century while excluding what in the 1980s were still called the "pseudo-sciences."[13]

Merchant built into *The Death of Nature* a much subtler and more complicated form of what came to be called the "Yates thesis" than anything proposed by Yates herself. In one of her most impressive and intricately argued chapters, "The World an Organism," Merchant developed a typology of new Renaissance "organicisms"—all of them reflecting Yates's "Hermetic" vision—that elaborated and transformed the old Aristotelian model of the cosmos. In Merchant's analysis, some of these (like that of the alchemical medical writer Paracelsus) were predicated on antiauthoritarian forms of vitalism that were deeply respectful of the natural order, while others (like that of Giambattista Della Porta, an influential theorist of natural magic) focused on the manipulation of natural species for human benefit and personal power. Merchant argued that from the later sixteenth through the eighteenth century, the diverse vitalist commitments and manipulatory ambitions of magical organicists both braked and fueled various versions of the new mechanical view of nature.

The negative reaction to Yates's work among a number of visible and vocal historians of early modern science inevitably affected the reception of *The Death of Nature*, which came out as these debates were approaching their height. Merchant's work, with its clear debt to the "Yates thesis," could not but annoy Yates's more traditionally minded critics, while the general scuffle, which remained strongly focused on Yates's arguments regarding "Hermeticism" rather than on astrological magic in general, in large part upstaged Merchant's book. At the same time, however, I think that both Yates's arguments (which seem weaker in retrospect) and Merchant's (which seem stronger) ran up against what Steven Shapin in his Focus essay calls the nascent "hyperprofessionalization" of the history of science. In addition to opaque prose and an unwillingness to connect to broader issues, he argues, symptoms of a hyperprofessionalizing discipline include "death by purification" and a tendency to "shun as heretics those who stray too far off approved disciplinary terrain."[14] Both Yates's and Merchant's work was impure in Shapin's sense—the antithesis of what the ambitious new discipline needed. They were women in a period in which academic authority was overwhelmingly vested in male voices and institutional structures; they worked on a grand scale that in context felt anachronistic; and they ranged freely among disciplines, drawing promiscuously on literary works and visual sources as well as approved philosophical and scientific texts. Not least, they made claims that linked up with issues of widespread interest among lay readers in the heady years of the 1960s and 1970s, including astrology and magic in Yates's case, supplemented by ecology and the oppression of women in Merchant's.

Just as important, Merchant's feminist argument, which insisted on the importance of gender in the historiography of early modern science and on the sexist assumptions that informed sixteenth- and seventeenth-century conceptions of the universe and human physiology, fell on unprepared soil. Although there were a number of well-respected women scholars writing on early modern science in the mid to late 1970s, to my knowledge none,

[13] Good summaries of the debate and the current state of thinking on the topic appear in Copenhaver, "Natural Magic, Hermetism, and Occultism in Early Modern Science" (cit. n. 11); and Stuart Clark, *Thinking with Demons: The Idea of Witchcraft in Early Modern Europe* (Oxford: Oxford Univ. Press, 1997), esp. Chs. 14, 19.

[14] Shapin, "Hyperprofessionalism and the Crisis of Readership in the History of Science" (cit. n. 6), p. 239; and Shapin, "Discipline and Bounding" (cit. n. 10), p. 357.

with the exception of Evelyn Fox Keller, had seriously addressed what Keller, in a remarkable essay from 1978, called the "genderization" of science.[15] Women and gender had not yet even begun to be integrated into the teaching of the Scientific Revolution. The assumption that Merchant's argument was of limited interest for the general historiography of early modern science is reflected in the fact that four of the five English-language reviews of *The Death of Nature* by scholars in the field were the work of women. (The exception was a review by Walter Pagel, who had a long-standing interest in the history of alchemy and magic.) In contrast, the book was widely reviewed not only by women in feminist studies of science by also by men interested in environmental issues.[16] I believe that the general lack of attention to *The Death of Nature* on the part of historians of early modern science arose at least in part from the centrality of the Scientific Revolution to the grand narrative that animated the discipline and served as the focus of so much early work in it. The power of this narrative created—and continues to create—blind spots and inflexibilities in the historiography of early modern science that are not easily overcome.[17]

I do not mean to imply that Merchant's book cannot legitimately be criticized. Parts of it are visionary, including its understanding of the importance of gender in early modern writing on nature; its use of social, environmental, and literary history to provide a context for the history of science; and its emphasis on the literary aspects of scientific texts and the metaphors that informed them. (Some reviewers found the last, which has since become a fairly standard approach, impossible to fathom.) Other pieces of Merchant's argument seem somewhat dated—not only her unambivalent embrace of the idea of a "Scientific Revolution," but her underestimation of the relevance of the "discovery" of America, with its vast and easily exploited animal, vegetable, mineral, and human resources, to important reorientations in attitudes toward the natural world in the early modern period. We are now also in a position to think more precisely about the ways in which women and nature were associated in early modern European culture, which had more to do with the exploitation of female reproductive bodies and metaphors of voyeurism and display than with modern ideas of rape.[18] But *The Death of Nature* is for me an exciting, living piece of scholarship, with which I can still argue and sections of which I continue to assign in my courses on early modern science—and not merely as an exercise in the historiography of the past.

What I and many of my students still find illuminating and inspiring in *The Death of Nature* is not only that it is a grand narrative, which allows us to think synthetically, but

[15] Evelyn Fox Keller, "Gender and Science," *Psychoanalysis and Contemporary Thought*, 1978, *1*:409–433, discussed not only Bacon's use of sexual and patriarchal metaphors of marriage but also modern cultural stereotypes of science and scientists as masculine, which she rooted in the psychoanalytic theory of object relations. I thank Pnina Abir-Am for this reference. Keller elaborated her argument concerning Bacon in "Baconian Science: A Hermaphroditic Birth," *Philosophy Forum*, 1980, *11*:299–308.

[16] See the list of reviews in Merchant, "*Death of Nature*: A Retrospective" (cit. n. 5), pp. 202–206. The other historians of early modern science who reviewed the book were Shirley Roe, Margaret Jacob, Margaret J. Osler, and Nina Gelbart. The book was widely reviewed by male scholars outside Great Britain and the United States.

[17] For some useful preliminary reflections see Biagioli, "Scientific Revolution Is Undead" (cit. n. 6). H. Floris Cohen's *The Scientific Revolution: A Historiographical Inquiry* (Chicago: Univ. Chicago Press, 1994) exemplifies these limitations.

[18] See, e.g., Londa Schiebinger, *The Mind Has No Sex? Women and the Origins of Modern Science* (Cambridge, Mass.: Harvard Univ. Press, 1989); Ludmilla Jordanova, *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries* (Madison: Univ. Wisconsin Press, 1989); and Katharine Park, "Nature in Person: Medieval and Renaissance Allegories and Emblems," in *The Moral Authority of Nature*, ed. Lorraine Daston and Fernando Vidal (Chicago: Univ. Chicago Press, 1994), pp. 50–73.

that it is a particular type of grand narrative. It focuses not so much on changes in "the process of knowledge making," which today would demand the study of important but sobering matters such as laboratory practice, credibility and trust, participation and reward, but on the heady imaginative enterprise of making up worlds. In this respect, Merchant's book harks back to an older scholarly tradition, represented by some of the key works that made me into a historian of medieval and early modern science: Koyré's *From the Closed World to the Infinite Universe* (yes, I admit it); E. M. W. Tillyard's *The Elizabethan World Picture*; and my personal favorite, C. S. Lewis's *The Discarded Image*.[19] These histories of ideas spoke to my imagination as well as my nascent interest in European history. Merchant's *Death of Nature* describes in part the dissolution of a magical worldview that attributed to the human imagination, informed by qualities and figures, formidable powers to alter physical reality; the parallel retreat from the imaginative processes of world making on the part of "hyperprofessional" historians of science—even though I am proud to count myself among them—causes me some regret.

The invented worlds described by Merchant are not confined to models of the cosmos, whether Ptolemaic or Copernican, vitalist or mechanist; they include models for better human societies as well. For me, her discussions of the great scientific utopias of the late sixteenth and early seventeenth centuries—Tommaso Campanella's *City of the Sun*, Johann Valentin Andreae's *Christianopolis*, and Francis Bacon's *New Atlantis*—lie at the heart of her book. Merchant's sensitivity to the continuities between the scientific enterprise of modeling the world and the literary process of writing plausible fictions, and to the importance of visual images and linguistic metaphors in each, does much to explain why *The Death of Nature* has had a greater impact on historians of early modern literature than on historians of early modern science.[20] For example, her passing remarks on Margaret Cavendish, a late seventeenth-century natural philosopher in the vitalist vein and the author of *A New World, Called the Blazing World*, one of the wilder early modern scientific utopias, opened the path for a host of books, chapters, and articles by English feminist literary scholars.

Indeed, what is for me the most enduring contribution of *The Death of Nature* to feminist historical scholarship is its focus on what Merchant, in a later retrospective essay, calls the "historical alternatives, both real and utopian, [that] challenged some of the excesses of mainstream society" in sixteenth- and seventeenth-century Europe.[21] These alternatives were both intellectual and social—ways of conceiving the world and ways of reorganizing society. They included not only Thomas More's *Utopia* and Campanella's cosmic *City of the Sun*, which imagined the abolition of private property and a somewhat more egalitarian role for women in the social and cultural order, but also Bacon's creepy, secretive Bensalem, in which women were reduced to breeders, and Cavendish's fantasy of female absolutism and bodies shared between multiple souls.

[19] Koyré, *From the Closed World to the Infinite Universe* (cit. n. 2); E. M. W. Tillyard, *The Elizabethan World Picture* (New York: Vintage, 1943); and C. S. Lewis, *The Discarded Image: An Introduction to Medieval and Renaissance Literature* (Cambridge: Cambridge Univ. Press, 1964). Kohler gives a useful summary of current thinking on the topics of laboratory practice, credibility and trust, and participation and reward in "Generalist's Vision" (cit. n. 6), pp. 226–228.

[20] See, e.g., Mary B. Campbell, *Wonder and Science: Imagining Worlds in Early Modern Europe* (Ithaca, N.Y.: Cornell Univ. Press, 1999); Sylvia Bowerbank, *Speaking for Nature: Women and Ecologies of Early Modern England* (Baltimore: Johns Hopkins Univ. Press, 2004); and Elizabeth Spiller, *Science, Reading, and Renaissance Literature: The Art of Making Knowledge, 1580–1670* (Cambridge: Cambridge Univ. Press, 2004).

[21] Merchant, "*Death of Nature*: A Retrospective" (cit. n. 5), p. 199.

Merchant's discussion of utopias reflected the importance of the topic for 1970s feminists. Interest in utopian writing was a signal element in the feminist political and authorial culture of the 1970s, allowing feminists to work through what a nonpatriarchal, nonsexist, or nonheterosexist society might entail. In her influential article "The Traffic in Women" (1975), Gayle Rubin described her vision of what she called a "feminist utopia": "I personally feel that the feminist movement must dream of even more than the elimination of the oppression of women. It must dream of the elimination of obligatory sexualities and sex roles." This important period of collective dreaming produced a host of latter-day feminist scientific utopias, including Ursula K. Le Guin's *The Dispossessed: An Ambiguous Utopia* (1974), Joanna Russ's *The Female Man* (1975), and Marge Piercy's *Woman on the Edge of Time* (1976).[22] At the same time, it allowed writers such as Samuel R. Delany, in *Triton* (1976), and John Varley, in "The Persistence of Vision" (1978), to think through the implications for queer male sexuality and for disability.[23] Like Merchant, all of these authors explored, among other things, the meanings of science for women: the ways in which women might participate in the creation of scientific knowledge and the way scientific knowledge, materialized in, for example, reproductive technologies and technologies of sex change, might in turn liberate women, often in the context of societies of scarcity constrained to live lightly on the land.

Merchant took this utopian impulse and gave it a critical and historiographical edge. The world of early modern Europe she described is anything but utopian; in this it is a significant rebuke to the naively positivist account of the Scientific Revolution against which she was reacting. She showed how writers—whether of fiction, criticism, or history—could use science both to reinforce oppressive social, political, and material orders and to imagine themselves out of them. This is for me the most inspiring aspect of Merchant's work, and it gets me back to *The Death of Nature* over and over again.

[22] Gayle Rubin, "The Traffic in Women: Notes on the Political Economy of Sex," in *Toward an Anthropology of Women*, ed. Rayna Reiter (New York: Monthly Review Press, 1975), pp. 157–210, on p. 204; Ursula K. Le Guin, *The Dispossessed: An Ambiguous Utopia* (New York: Harper & Row, 1974); Joanna Russ, *The Female Man* (Toronto: Bantam, 1975); and Marge Piercy, *Woman on the Edge of Time* (New York: Knopf, 1976). For an introduction to these and other works see, e.g., Lucy Sargisson, *Contemporary Feminist Utopianism* (London: Routledge, 1996); Jane Donawerth, *Frankenstein's Daughters: Women Writing Science Fiction* (Syracuse, N.Y.: Syracuse Univ. Press, 1997); and Susan Squier, *Babies in Bottles: Twentieth-Century Visions of Reproductive Technology* (New Brunswick, N.J.: Rutgers Univ. Press, 1994). The only utopian work of the 1970s explicitly cited by Merchant is Ernest Callenbach, *Ecotopia: The Notebooks and Reports of William Weston* (Berkeley, Calif.: Banyan Tree, 1975).

[23] Samuel R. Delany, *Triton* (New York: Bantam, 1976); and John Varley, "The Persistence of Vision," in *The Persistence of Vision* (New York: Dell, 1978), pp. 263–316. On Delany's *Triton* see Tom Moylan, *Scraps of the Untainted Sky: Science Fiction, Utopia, and Dystopia* (Boulder, Colo.: Westview, 2000). Donna Haraway, among more recent writers on feminist science studies, has used Varley's work as a springboard. See Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989); and Haraway, "The Persistence of Vision," in *Writing on the Body: Female Embodiment and Feminist Theory*, ed. Katie Conboy, Nadia Medina, and Sarah Stanbury (New York: Columbia Univ. Press, 1997), pp. 283–295.